

AS7.46/3:3/954

Federal -State Cooperative  
Snow Surveys and Water Supply Forecasts  
for  
Montana and Northern Wyoming  
Upper Missouri,  
Upper Columbia and  
Yellowstone Rivers



DIVISION OF IRRIGATION, SOIL CONSERVATION SERVICE  
UNITED STATES DEPARTMENT OF AGRICULTURE  
AND  
MONTANA AGRICULTURAL EXPERIMENT STATION

In cooperation with the U. S. Forest Service, U. S. Geological Survey,  
National Park Service, U. S. Bureau of Reclamation, State Engineers of  
Montana and Wyoming and other Federal, State and local organizations.

AS OF  
MAR. 1, 1954



3 0864 1006 6133 2

UNITED STATES DEPARTMENT OF AGRICULTURE  
SOIL CONSERVATION SERVICETO RECIPIENTS OF COOPERATIVE SNOW SURVEY  
AND WATER SUPPLY FORECAST REPORTS:

Forecasts by U. S. Weather Bureau of total annual streamflow October-September, inclusive, at more than 300 gaging stations are issued monthly January through May in the publication WATER SUPPLY FORECASTS FOR THE WESTERN UNITED STATES.

Weather Bureau forecasts of runoff presented in that bulletin are computed from procedures based on mathematical analysis of the relation between precipitation and runoff.

The Weather Bureau bulletins may be secured by writing to:

Hydrologist in Charge  
River Forecast Center  
U. S. Weather Bureau  
712 Federal Office Building  
Kansas City 6, Missouri

For current information on local river and flood conditions, reference should be made to the appropriate River District Office, listed below:

Meteorologist in Charge.....Missouri River and  
Weather Bureau Office tributaries above  
Box 1705 Fort Peck Dam; Milk  
Helena, Mont. River

Meteorologist in Charge.....Yellowstone River  
Weather Bureau Airport Station and tributaries.  
Box 1338 Billings, Mont.

Meteorologist in Charge.....Columbia River and  
Weather Bureau Airport Station tributaries above  
R.F.D. #1 and including Grand  
Spokane, Washington Coulee Dam.

State of Montana

FEDERAL - STATE COOPERATIVE SNOW SURVEYS  
AND  
WATER SUPPLY FORECASTS

FOR  
MONTANA AND NORTHERN WYOMING  
(Upper Missouri and Upper Columbia River Basins)

Report issued by:

Truman C. Anderson  
State Conservationist  
of Montana

M. M. Kelso  
Director, Montana  
Agricultural Experiment Station

Report Prepared by:

A. R. Codd  
Hydraulic Engineer  
Soil Conservation Service

and

O. W. Monson  
Irrigation Engineer  
Montana Agricultural Experiment Station

Soil Conservation Service  
U. S. Department of Agriculture  
and  
Montana Agricultural Experiment Station  
Bozeman, Montana

1920-1921 - 1922-1923 - 1923-1924

1924-1925 - 1925-1926 - 1926-1927

1927-1928 - 1928-1929 - 1929-1930

1930-1931 - 1931-1932 - 1932-1933

1933-1934 - 1934-1935

1935-1936 - 1936-1937 - 1937-1938

1938-1939 - 1939-1940 - 1940-1941

1941-1942 - 1942-1943 - 1943-1944

1944-1945 - 1945-1946 - 1946-1947

1947-1948 - 1948-1949 - 1949-1950

1950-1951 - 1951-1952 - 1952-1953

1953-1954 - 1954-1955 - 1955-1956

1956-1957 - 1957-1958 - 1958-1959

1959-1960 - 1960-1961 - 1961-1962

WATER SUPPLY OUTLOOK  
FOR SEASON 1954  
AS OF MARCH 1, 1954

## JEFFERSON RIVER:

The snow-pack over the Beaverhead and Jefferson River as a whole is below average and preliminary water forecasts would at this time indicate that the tributaries will flow approximately 20% below the average.

## MADISON RIVER:

The snow-pack over the Madison River is slightly above average with an outlook of water supply being approximately 100% average.

### GALLATIN RIVER:

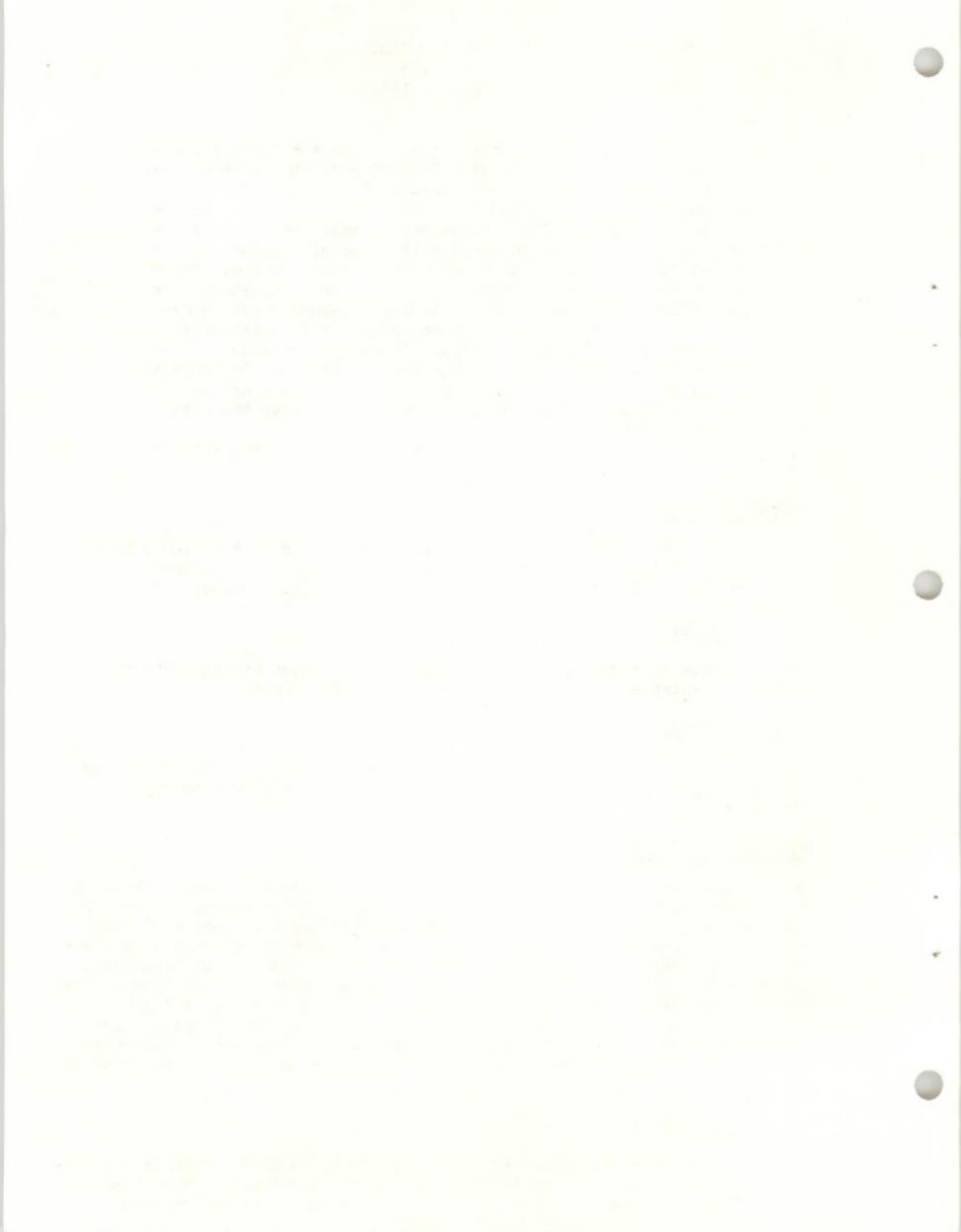
Although some of the snow measurements on the Gallatin showed higher than normal preliminary forecasts of water supply indicate approximately 92-80% average.

### MISSOURI RIVER MAIN STEM:

Some of the tributaries to the Main Stem of the Missouri River, such as the Teton, Sun and Marias River have a snow-pack well above average. However, the deficiency of water above Toston will affect the flow into Fort Peck, which appears at this time to be approximately 94% average. The snow cover on the Sun River is 72% greater than last year and 47% greater than 1952, and 148% average for 7 to 20 years. It is anticipated that the flow of the Sun River at Vaughn will be approximately 578,000 acre feet, or 128% average. This figure is the observed flow plus or minus changes of the several reservoirs above Vaughn. With Gibbons Reservoir now at 73% capacity, it would appear to be a little high in comparison with the anticipated runoff from this basin.

### YELLOWSTONE RIVER:

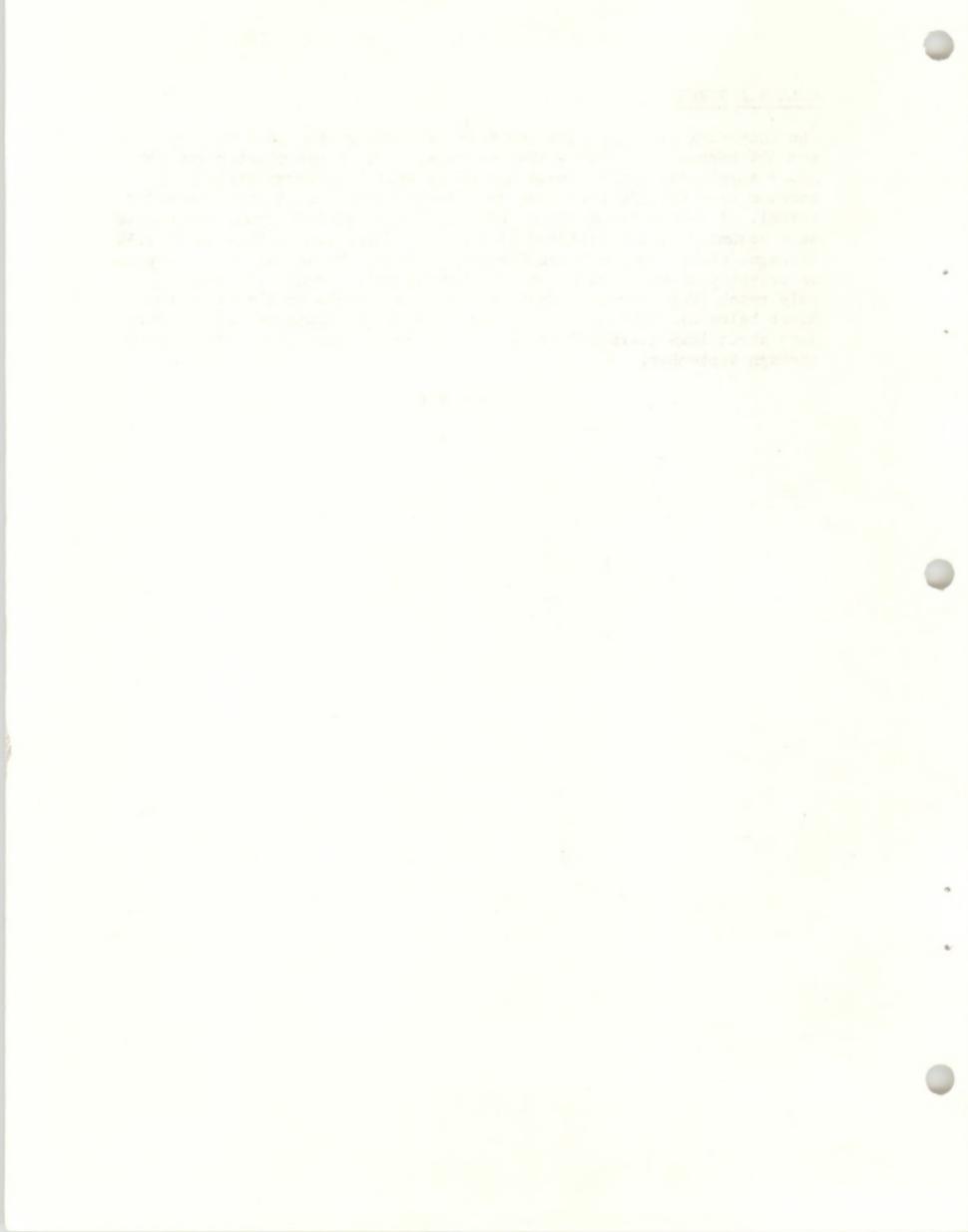
The snow-pack over the Upper Yellowstone River Basin in the Park is approximately 10% above average and the river at Corwin Springs will more than likely flow approximately 2 million acre feet during April-September.



COLUMBIA RIVER:

The snow-pack over the Flathead Basin is better than last year by 67%, and 35% better than 1952 - 124% average. It is anticipated that the water supply for Hungry Horse Reservoir will be approximately 115% average on 2,591,000 acre feet from April through September, provided normal. A normal accumulation of snow occurs during March. With this same assumption, the Flathead at Columbia Falls should flow about 115% average, also. On the Clark Fork River, above Missoula, the snow-pack is slightly above average and the flow of this stream will probably only reach 103% average. Considerable snow exists on the Clark Fork River below Missoula and when combined with the Flathead, should produce about 129% average flow at Cabinet Gorge during the period April through September.

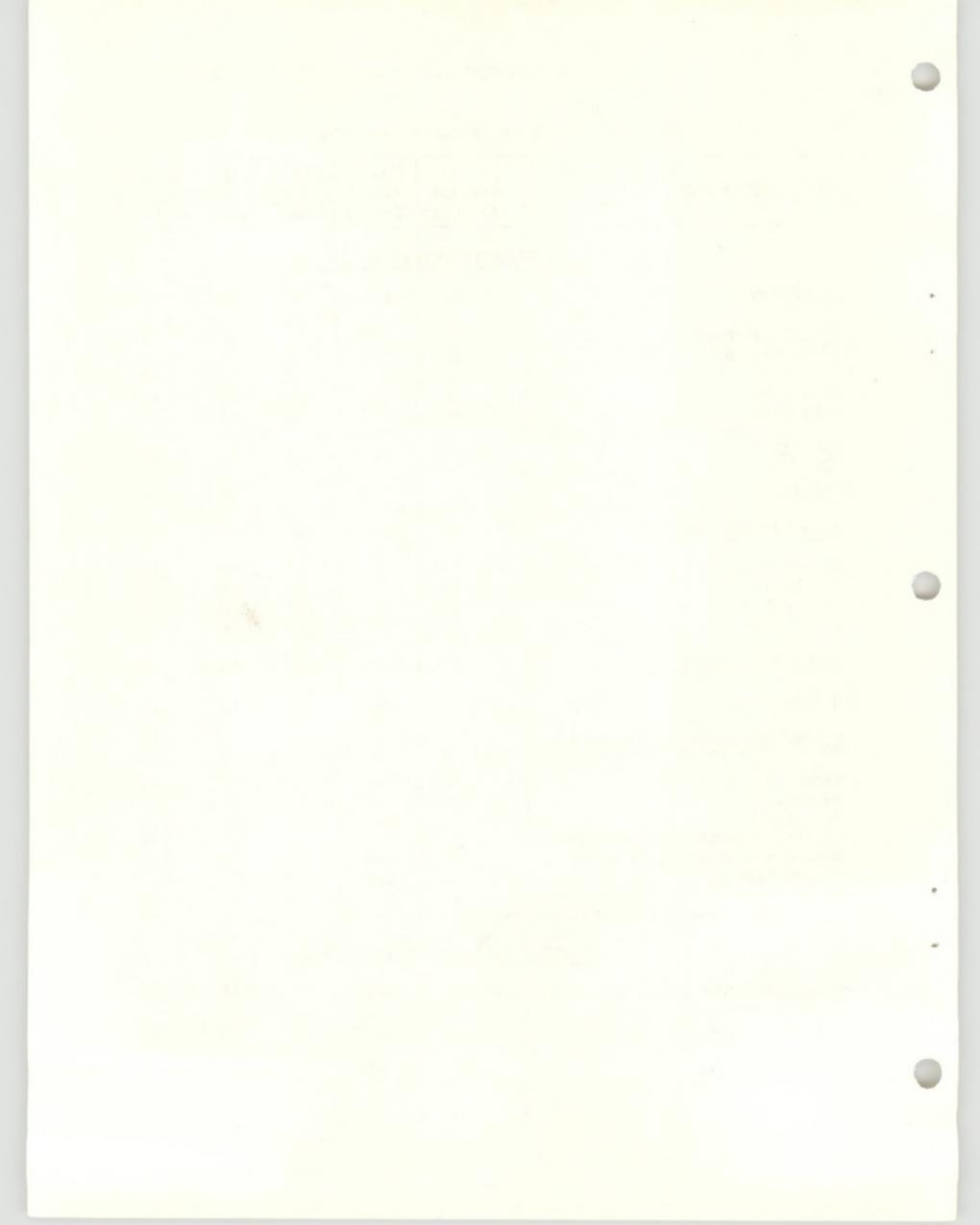
\* \* \* \*

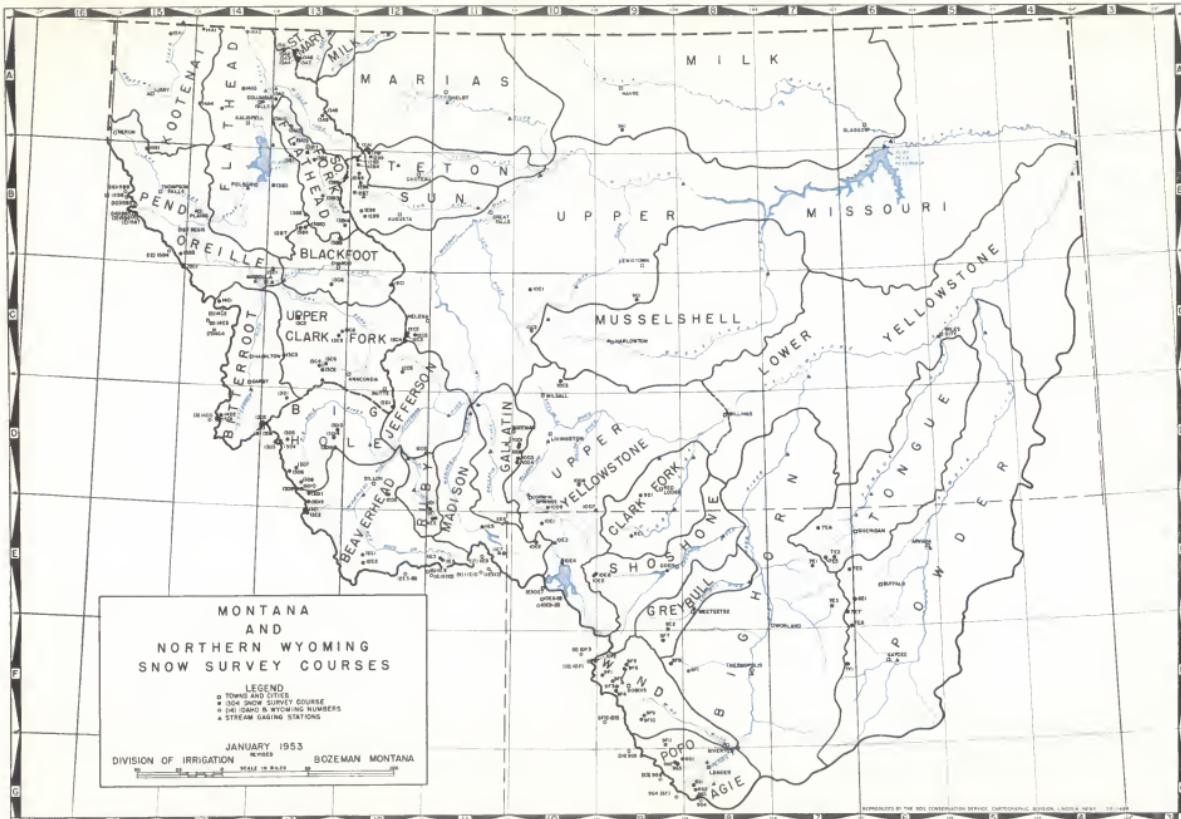


## COMPARISON OF SNOW COVER WITH THAT OF PREVIOUS YEARS

Summary of Snow Survey Data by Tributary Watersheds as of March 1, 1954

TRIBUTARY BASINS	No. of Courses Averaged	No. Years Record	1954 Snow Water Equivalent expressed as Percent of		
			1953%	1952%	AVERAGE%
<u>MISSOURI RIVER BASIN IN MONTANA</u>					
<u>JEFFERSON</u>	26	3-18	76	68	70
Rock-Beaverhead	5	3-18	61	46	47
Horse Prairie	6	6	73	71	77
Big Hole	7	7	88	84	93
Wise River	2	6	90	89	98
Ruby River	6	5	69	57	77
<u>MADISON</u>	7	6-20	110	63	105
<u>GALLATIN</u>	4	7-19	95	64	103
<u>MISSOURI MAIN STEM</u>	9	9-20	101	82	107
Teton River	3	6	111	160	130
Sun River	7	6-20	172	147	148
Marias River	1	20	160	131	162
Milk River	1	13	110	65	91
<u>UPPER YELLOWSTONE</u>	7	2-17	102	83	104
Shields River	1	16	66	49	95
<u>LOWER YELLOWSTONE, WYOMING</u>					
Shoshone	2	5-11	93	81	93
Wind River	14	4-17	97	95	90
Popo Agie	6	5-17	120	81	112
Owl Creek on the Big Horn River	2	5	155	135	125
Wood River on Greybull River	2	2-5	105	163	105
Tongue River	3	3-4	127	140	142
Clear Creek on the Powder River	1	3	58	53	51
Crazy Woman Creek on the Powder Riv	1	1	90	--	--
<u>COLUMBIA RIVER BASIN IN MONTANA</u>					
KOOTENAI RIVER, above Libby, Montana	9	3-17	152	144	150
FLATHEAD RIVER	16	3-20	167	135	124
UPPER CLARKFORK	15	2-20	111	105	127
PEND OREILLE	6	7-29	138	106	135



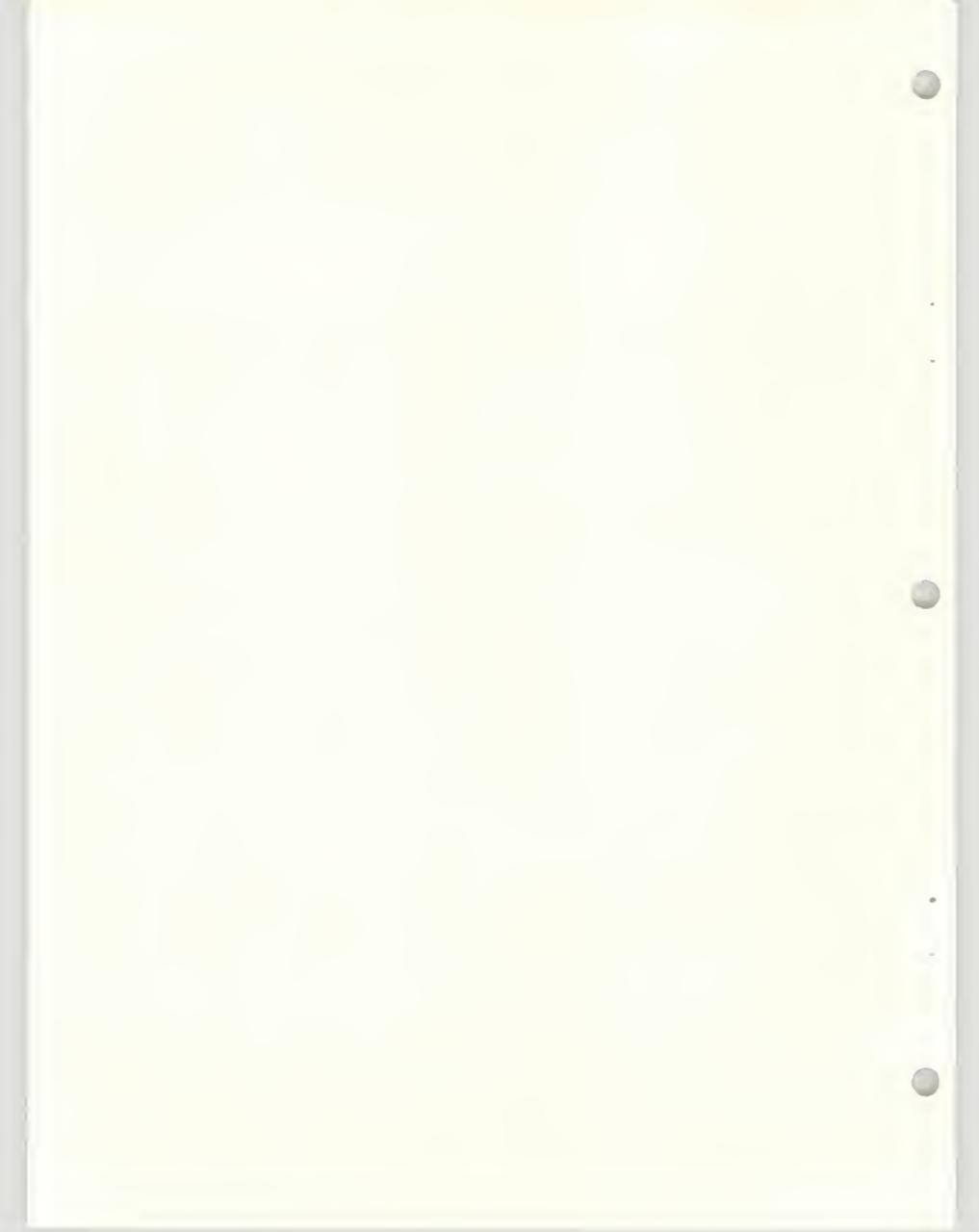


# INDEX TO MONTANA & NORTHERN WYOMING SNOW COURSES

Drainage Basin and Course Name	Montana Number	State Number	Date Data Made	Range 25000 25000	Measured Date 25000	Location	Drainage Basin and Course Name	Montana Number	State Number	Date Data Made	Range 25000 25000	Measured Date 25000	Location		
<b>MISSOURI RIVER DRAINAGE</b>															
Lakeview Ridge	1103	7400	27	145	29	1908	3,4,5	9	8400	990	6	470	1200	1200	8,2,4,5
Lakeview Canyon	1104	6970	26	145	29	2108	3,4,5	10	8400	892	56	430	1200	1200	8,2,4,5
White Pine Ridge	1202	6900	18	145	29	2108	3,4	11	8400	747	55	400	1200	1200	8,2,4,5
<b>MISSOURI RIVER DRAINAGE, CONT.</b>															
<b>(UPPER MISSOURI)</b>															
Elbow Creek	13010	7400	13	88	26	1908	3,4,5	1	8400	990	5	470	1200	1200	8,2,4,5
Gold Creek	13011	7400	11	88	26	1908	3,4,5	1	8400	990	5	470	1200	1200	8,2,4,5
Terrell Creek	13012	6400	14	98	154	1908	3,4,5	1	8400	990	5	470	1200	1200	8,2,4,5
Whitefish Creek	13013	6400	14	98	154	1908	3,4,5	1	8400	990	5	470	1200	1200	8,2,4,5
Salmon Justus	13011	6800	27	88	154	1908	3,4,5	1	8400	990	5	470	1200	1200	8,2,4,5
<b>(UPPER MISSOURI)</b>															
Big Hole Pass (Below)	1305	7400	28	38	1908	3,4,5	1	8400	1000	17	520	1000	1000	8,2,4,5	
Big Hole Pass	1306	7400	28	38	1908	3,4,5	1	8400	1000	36	560	990	1000	8,2,4,5	
Glacier Pass	1307	7400	28	38	1908	3,4,5	1	8400	1000	36	560	990	1000	8,2,4,5	
Gibson Pass	1308	7400	4	38	1908	3,4,5	1	8400	1000	36	560	990	1000	8,2,4,5	
Grinnell Creek	1309	7400	27	73	1908	3,4,5	1	8400	1000	36	560	990	1000	8,2,4,5	
Grinnell Creek	1310	7400	27	73	1908	3,4,5	1	8400	1000	36	560	990	1000	8,2,4,5	
Glacier Lake	1307	6700	10	68	166	1945	3,4,5	1	8400	1000	18	430	990	1000	8,2,4,5
<b>(UPPER MISSOURI)</b>															
Anderson Pass	13011	7000	18	38	1200	1908	3,4,5	1	8400	1000	18	430	990	1000	8,2,4,5
Big Sky Pass	13011	6500	15	38	1200	1908	3,4,5	1	8400	1000	18	430	990	1000	8,2,4,5
Big Sky Pass	13012	6500	15	38	1200	1908	3,4,5	1	8400	1000	18	430	990	1000	8,2,4,5
<b>(UPPER MISSOURI)</b>															
Cottonwood	1309	3900	21	108	29	1908	3,4,5	1	8400	1000	18	430	990	1000	8,2,4,5
Cottonwood (Upper)	1310	6200	30	108	29	1908	3,4,5	1	8400	1000	18	430	990	1000	8,2,4,5
Flashlight	1307	6900	22	88	120	1908	3,4,5	1	8400	1000	18	430	990	1000	8,2,4,5
Flashlight Creek	1308	6900	22	88	120	1908	3,4,5	1	8400	1000	18	430	990	1000	8,2,4,5
Flashlight Creek	1309	6900	22	88	120	1908	3,4,5	1	8400	1000	18	430	990	1000	8,2,4,5
Flashlight Creek	1310	6900	22	88	120	1908	3,4,5	1	8400	1000	18	430	990	1000	8,2,4,5
<b>(UPPER MISSOURI)</b>															
McKenzie River	1309	22	118	38	1934	1,2,3,4,5	2	8400	1000	18	430	990	1000	8,2,4,5	
McKenzie River	1310	22	118	38	1934	1,2,3,4,5	2	8400	1000	18	430	990	1000	8,2,4,5	
<b>(UPPER MISSOURI, Main Stem)</b>															
Chesapeak Reservoir	1205	6200	2	88	59	1930	1,2,3,4,5	2	8400	1000	18	430	990	1000	8,2,4,5
Crystal Lake	921	6100	24	128	171	1931	3,4,5	1	8400	1000	18	430	990	1000	8,2,4,5
Crystal Lake	922	6100	24	128	171	1931	3,4,5	1	8400	1000	18	430	990	1000	8,2,4,5
Crystal Lake	923	6100	24	128	171	1931	3,4,5	1	8400	1000	18	430	990	1000	8,2,4,5
Crystal Lake	924	6100	24	128	171	1931	3,4,5	1	8400	1000	18	430	990	1000	8,2,4,5
Crystal Lake	925	6100	24	128	171	1931	3,4,5	1	8400	1000	18	430	990	1000	8,2,4,5
Crystal Lake	926	6100	24	128	171	1931	3,4,5	1	8400	1000	18	430	990	1000	8,2,4,5
Crystal Lake	927	6100	24	128	171	1931	3,4,5	1	8400	1000	18	430	990	1000	8,2,4,5
Crystal Lake	928	6100	24	128	171	1931	3,4,5	1	8400	1000	18	430	990	1000	8,2,4,5
Crystal Lake	929	6100	24	128	171	1931	3,4,5	1	8400	1000	18	430	990	1000	8,2,4,5
Crystal Lake	930	6100	24	128	171	1931	3,4,5	1	8400	1000	18	430	990	1000	8,2,4,5
Crystal Lake	931	6100	24	128	171	1931	3,4,5	1	8400	1000	18	430	990	1000	8,2,4,5
Crystal Lake	932	6100	24	128	171	1931	3,4,5	1	8400	1000	18	430	990	1000	8,2,4,5
Crystal Lake	933	6100	24	128	171	1931	3,4,5	1	8400	1000	18	430	990	1000	8,2,4,5
Crystal Lake	934	6100	24	128	171	1931	3,4,5	1	8400	1000	18	430	990	1000	8,2,4,5
Crystal Lake	935	6100	24	128	171	1931	3,4,5	1	8400	1000	18	430	990	1000	8,2,4,5
Crystal Lake	936	6100	24	128	171	1931	3,4,5	1	8400	1000	18	430	990	1000	8,2,4,5
Crystal Lake	937	6100	24	128	171	1931	3,4,5	1	8400	1000	18	430	990	1000	8,2,4,5
Crystal Lake	938	6100	24	128	171	1931	3,4,5	1	8400	1000	18	430	990	1000	8,2,4,5
Crystal Lake	939	6100	24	128	171	1931	3,4,5	1	8400	1000	18	430	990	1000	8,2,4,5
Crystal Lake	940	6100	24	128	171	1931	3,4,5	1	8400	1000	18	430	990	1000	8,2,4,5
Crystal Lake	941	6100	24	128	171	1931	3,4,5	1	8400	1000	18	430	990	1000	8,2,4,5
Crystal Lake	942	6100	24	128	171	1931	3,4,5	1	8400	1000	18	430	990	1000	8,2,4,5
Crystal Lake	943	6100	24	128	171	1931	3,4,5	1	8400	1000	18	430	990	1000	8,2,4,5
Crystal Lake	944	6100	24	128	171	1931	3,4,5	1	8400	1000	18	430	990	1000	8,2,4,5
Crystal Lake	945	6100	24	128	171	1931	3,4,5	1	8400	1000	18	430	990	1000	8,2,4,5
Crystal Lake	946	6100	24	128	171	1931	3,4,5	1	8400	1000	18	430	990	1000	8,2,4,5
Crystal Lake	947	6100	24	128	171	1931	3,4,5	1	8400	1000	18	430	990	1000	8,2,4,5
Crystal Lake	948	6100	24	128	171	1931	3,4,5	1	8400	1000	18	430	990	1000	8,2,4,5
Crystal Lake	949	6100	24	128	171	1931	3,4,5	1	8400	1000	18	430	990	1000	8,2,4,5
Crystal Lake	950	6100	24	128	171	1931	3,4,5	1	8400	1000	18	430	990	1000	8,2,4,5
Crystal Lake	951	6100	24	128	171	1931	3,4,5	1	8400	1000	18	430	990	1000	8,2,4,5
Crystal Lake	952	6100	24	128	171	1931	3,4,5	1	8400	1000	18	430	990	1000	8,2,4,5
Crystal Lake	953	6100	24	128	171	1931	3,4,5	1	8400	1000	18	430	990	1000	8,2,4,5
Crystal Lake	954	6100	24	128	171	1931	3,4,5	1	8400	1000	18	430	990	1000	8,2,4,5
Crystal Lake	955	6100	24	128	171	1931	3,4,5	1	8400	1000	18	430	990	1000	8,2,4,5
Crystal Lake	956	6100	24	128	171	1931	3,4,5	1	8400	1000	18	430	990	1000	8,2,4,5
Crystal Lake	957	6100	24	128	171	1931	3,4,5	1	8400	1000	18	430	990	1000	8,2,4,5
Crystal Lake	958	6100	24	128	171	1931	3,4,5	1	8400	1000	18	430	990	1000	8,2,4,5
Crystal Lake	959	6100	24	128	171	1931	3,4,5	1	8400	1000	18	430	990	1000	8,2,4,5
Crystal Lake	960	6100	24	128	171	1931	3,4,5	1	8400	1000	18	430	990	1000	8,2,4,5
Crystal Lake	961	6100	24	128	171	1931	3,4,5	1	8400	1000	18	430	990	1000	8,2,4,5
Crystal Lake	962	6100	24	128	171	1931	3,4,5	1	8400	1000	18	430	990	1000	8,2,4,5
Crystal Lake	963	6100	24	128	171	1931	3,4,5	1	8400	1000	18	430	990	1000	8,2,4,5
Crystal Lake	964	6100	24	128	171	1931	3,4,5	1	8400	1000	18	430	990	1000	8,2,4,5
Crystal Lake	965	6100	24	128	171	1931	3,4,5	1	8400	1000	18	430	990	1000	8,2,4,5
Crystal Lake	966	6100	24	128	171	1931	3,4,5	1	8400	1000	18	430	990	1000	8,2,4,5
Crystal Lake	967	6100	24	128	171	1931	3,4,5	1	8400	1000	18	430	990	1000	8,2,4,5
Crystal Lake	968	6100	24	128	171	1931									

## STATUS OF RESERVOIR STORAGE MARCH 1, 1954

PASIN & STREAM	RESERVOIR	USEABLE CAPACITY (M.A.F.)	THOUSAND ACRE FEET IN STORAGE				
			MARCH 1				10-yr avg 1942-51
1954	1953	1952	1951				
<u>MISSOURI RIVER BASIN</u>							
Beaverhead	Lima	84.00	18.8	30.9	35.6	37.9	39.4
Ruby River	Ruby	38.85					
Madison Riv	Hebgen Lk	345.00	155.1	179.3	264.4	230.8	237.6
Madison Riv	Ennis Lk	41.00	38.5	34.4	35.1	35.2	35.1
Hyalite Crk	Middle Crk		2.3	--	--	--	New
Missouri Riv	Canyon Ferry	401.70	421.0	18.4	18.9	19.3	30.4
Missouri Riv	Hauser Lk (Inc. Lk Helena)	62.50	62.5	57.3	46.3	57.2	50.7
Missouri Riv	Lk Helena	10.45	10.4	8.6	5.1	8.6	12.9**
Missouri Riv	Holter Lk	81.92	74.9	58.7	49.8	65.1	56.1
N.Fk.Sun Riv	Gibson	105.00	76.7	53.4	66.4	81.5	64.5
N.Fk.Sun Riv	Willow Crk	32.30	26.4	20.1	24.0	23.8	14.5
N.Fk.Sun Riv	Pishkun	32.00	20.6	17.7	23.3	18.9	18.5
Teton Riv	Bynum						
Birch Crk	Swift	30.00	22.6	--	23.1	28.1	23.5
Dupuyer &	Lk Francis						
Birch Crk		112.00	92.2	95.5	93.6	93.5	82.0
Judith Riv	Ackley Lk	5.82	2.4	2.5	3.8	4.9	4.4
Missouri Riv	Ft. Peck	19,000.00	12,180.00	12,570.	11,690.	12,340.	10,458.
Milk Riv	Fresno	127.20	79.0	76.8	90.3	65.9	51.3
Milk Riv	Nelson	66.80	28.8	30.3	38.5	15.7	28.2
W.Rosebud Crk	Mystic Lk	20.80	10.1	6.8	8.2	8.7	9.3
Red Lodge Crk	Cooney	27.50			8.6	8.4	9.6
Tongue Riv	Tongue Riv	73.90		14.5	18.3	8.4	9.9
Swiftcurrent Crk	Sherburne Lk	66.10		17.2	18.4	27.9	23.8
xx 8 year average							
<u>MISSOURI RIVER BASIN * WYOMING</u>							
Shoshone Riv	Buffalo Bill	440.00	153.2	151.2	237.0	295.6	297.4
Wind Riv	Boysen	758.00	361.9	540.8	122.0	--	--
Wind Riv	Pilot Butte	31.6	12.0	12.4	9.3	8.4	12.7
Bull Creek	Bull Lk	152.00	76.8	60.8	66.6	89.5	62.3
Belle Fourche	Key Hole	190.00	8.7	8.3			
<u>MISSOURI RIVER BASIN - NORTH DAKOTA</u>							
Hart River	Hart Butte	54.80	54.4				
Hart River	Dickerson	4.3	6.8				
<u>MISSOURI RIVER BASIN - SOUTH DAKOTA</u>							
Belle Fourche	Belle Fourche	185.00	109.1	52.0	88.0	81.0	116.0
Cheyenne River	Angostura	160.00	31.0	109.0	112.0	28.0	--
Cheyenne River	Deerfield	15.1	15.4	13.5			
Grand River	Shadehill	84.00	82.3	78.0			



STATUS OF RESERVOIR STORAGE MARCH 1, 1954

BASIN & STREAM	RESERVOIR	USEABLE CAPACITY (M.A.F.)	THOUSAND ACRE FEET IN STORAGE ABOUT				
			MARCH 1				
			1954	1953	1952	1951	10-yr avg 1942-51
<u>COLUMBIA RIVER BASIN</u>							
Flint Crk	Georgetown Lk	31.00	21.1	22.9	23.4	23.0	23.7
S.Fk.Flathead	Hungry Horse	3,500.00	2,021.0	706.5	65.8	--	--
Flathead Riv	Flathead Lk	1,791.00	836.5	828.1	730.1	902.7	720.4
Little	Little						
*Bitterroot	Bitterroot	36.10	28.4	29.4	36.1	34.8	15.0
*Dry Fork Crk	Dry Fork	6.70	2.4	4.1	4.1	4.4	2.2
**Flathead							
Irrigation Pr.	Mission Valley	98.60	19.0	33.6	34.6	49.8	37.0
Jocko Crk	Lwr Jock Lk	7.6	Snow	Snow	Snow	Snow	Snow
			Bound	Bound	Bound	Bound	Bound

\* Sum of two reservoirs on Little Bitterroot

\* Sum of two reservoirs on Dry Fork Creek

\*\* Sum of (8) eight reservoirs on Project



## MONTANA SNOW SURVEYS - MARCH 1, 1954

MISSOURI BASIN DRAINAGE BASIN AND SNOW COURSE	No.	Elev.	SNOW COVER MEASUREMENTS						
			1954			Past Record			Years of Record
			Date of Survey	Snow Depth (In.)	Water Content (In.)	Water Content (In.)	1953	1952	Average
<u>JEFFERSON RIVER</u>									
(Rock-Beaverhead)									
Lakeview Ridge	11E3	7400	3/2	40	7.9	9.9	13.4	9.2	6
Lakeview Canyon	11E4	6930	3/2	38	10.2	11.2	14.6	11.3	6
Limekiln	12E2	6950	2/11	00	0.0	10.0	10.0	1.6	6
White Pine Rdg	12E1	8850	2/11	16	2.7	5.8	6.6	5.2	6
*Kilgore									
*Camp Creek	12E3	6800	2/28	32	8.7	11.5	18.9	8.7	18
*Blue Ldg Mine	11E11	6700							
(Horse Prairie)									
Bloody Dick	13D10	7600	2/15	33	8.8	12.0	11.0	10.9	6
Gold Stone	13D9	8100	2/15	40	11.8	15.4	13.0	12.6	6
Lemhi Pass	13E1	7400	2/10	18	4.7	6.1	11.0	8.2	6
Terrell Creek	13D12	6650	2/12	13	3.6	5.6	4.6	4.5	6
Trail Creek	13E2	7090	2/10	20	4.8	6.4	8.1	7.0	6
Selway Junction	13D11	6500	2/12	23	6.0	8.4	8.2	7.4	6
(Big Hole)									
Big Hole Pass	13D3	7440	2/16	44	14.1	14.6	17.6	16.0	6
Big Hole (Below)	13D4	6900	2/16	40	12.3	12.9	13.6	13.6	6
East Boundary	13D5	6700	2/16	24	6.2	7.3	7.9	7.6	6
Gibbons Pass	13D2	7100	2/25	64	21.4	24.4	25.6	19.3	20
Jahnke Creek	13D8	7340	2/15	35	8.8	11.4	10.4	10.3	6
Miner Forks	13D6	7300	2/14	38	10.2	12.3	10.8	10.8	6
Miner Lake	13D7	6720	2/14	32	6.9	6.9	7.6	7.4	9
*Moose Creek	13D16	6200	3/1	51	15.6	19.0	--	14.2	14
(Wise River)									
Anderson Meadow	13D14	7000	2/18	31	7.6	8.4	8.3	7.8	6
Elk Horn	13D15	8450							
Wise River	13D13	6300	2/18	23	5.1	5.7	6.0	5.2	6
(Ruby River)									
Cottonwood	11R2	5900	2/10	26	7.2	8.2	11.4	8.0	6
Cottonwood (Up)	11E1	8400	2/10	26	7.4	9.1	13.0	8.7	6
Flashlight	12D3	6950	3/2	17	3.7	6.4	4.4	4.1	9
Tobacco Root	12D2	6900	2/9	21	5.1	10.6	11.2	9.0	6
Vigilante	11D1	6125	2/10	5	1.1	1.5	3.3	1.3	6
<u>MADISON RIVER</u>									
Hebgen	11E5	6550	3/1	36	10.1	9.3	18.5	11.0	20
W. Yellowstone	11E7	6700	3/1	36	10.4	10.0	16.5	10.3	20
21-Mile	11E6	7150	3/1	56	16.4	14.7	25.3	14.2	20
*Big Springs	11E9	6500	2/26	62	20.8	18.9	31.0	18.5	18
*Island Park	11E10	3600	2/27	51	15.5	15.1	26.4	14.7	18
*Valley View	11E8	6500	2/27	45	12.4	12.9	23.8	13.6	9
Norris Basin	10E2	7500	3/1	34	9.8	6.3	9.3	8.1	13

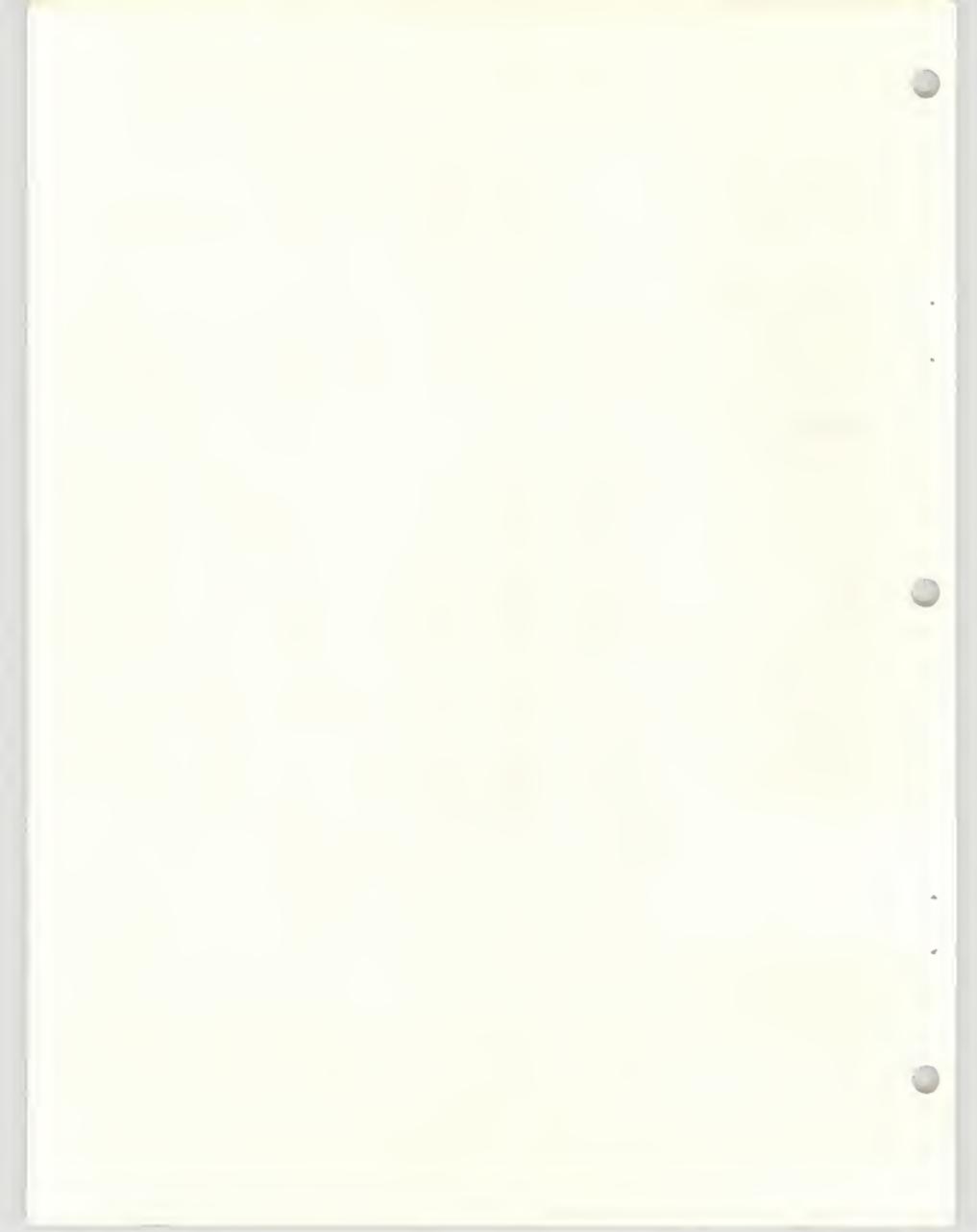
\*Adjacent Basin



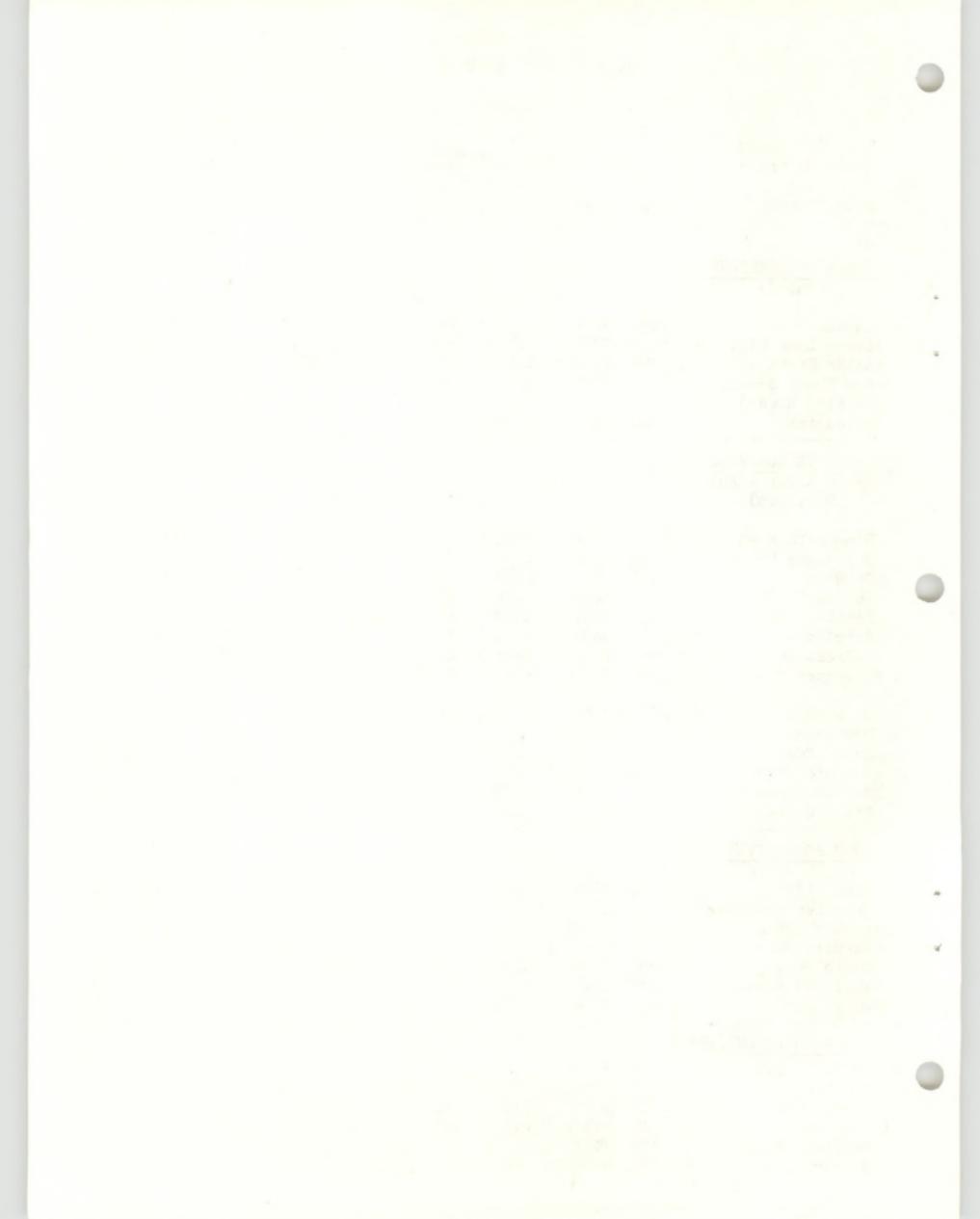
## MONTANA SNOW SURVEYS - MARCH 1, 1954

MISSOURI BASIN DRAINAGE BASIN AND SNOW COURSE	No.	Elev.	Date of Survey	SNOW COVER MEASUREMENTS					
				1954 Snow Depth (In.)	Water Content (In.)	Fast Record 1953	Water Content 1952	(In.) Average	Years of Record
<u>GALLATIN RIVER</u>									
Devil's Slide	10D4	8100	2/27	48	13.7	15.6	20.5	15.3	19
Hood Meadow	10D3	6600	2/25	20	5.6	6.4	10.3	6.6	19
New World	10D1	6700	3/3	26	6.8	7.8	10.4	8.6	12
21-Mile	11R6	7150	3/1	56	16.4	14.7	25.3	14.2	20
<u>MISSOURI RIVER</u> <u>MAIN STEM</u>									
Chessman Res.	12C5	6200	3/1	15	3.4	4.2	5.7	4.4	18
Crystal Lake	9C1	6100	2/27	44	9.4	8.8	14.4	10.3	13
Kings Hill	10C1	7950	3/2	44	11.9	9.7	14.1	10.4	20
Picnic Grounds	13C6	6500	3/1	20	4.2	6.0	6.2	4.4	9
Pipestone Pass	12D1	7200	3/1	17	4.4	4.9	4.9	4.2	16
Stemple Pass	12C1	6900	3/2	45	12.1	8.9	12.0	8.3	20
Tenmile, Lower	12C2	6250	3/3	26	6.4	6.4	7.2	5.7	19
Tenmile, Middle	12C3	6800	3/4	35	8.8	9.5	10.1	8.3	20
Tenmile, Upper (Teton River)	12C4	8000	3/4	39	10.9	12.1	12.9	10.7	19
Fright Creek	12A1	6000	2/27	64	21.2	19.7	14.0	16.4	6
Waldron Creek	12B2	5600	2/26	34	9.5	7.2	5.9	7.1	6
West Fork (Sun River)	12B1	6000	2/26	62	20.0	18.8	11.4	15.5	6
Benchmark	12B8	5500	2/25	42	15.0	7.0	10.1	8.9	6
Cabin Creek	12B6	5400	2/26	33	9.0	6.1	6.8	6.8	5
5-Bull	12B9	5600	2/25	38	12.6	5.1	6.5	7.0	6
Gates Park	12B5	5300	2/27	50	14.7	8.1	10.5	10.1	5
Goat Mountain	12B7	7000	3/3	57	16.3	9.5	11.2	8.7	20
Wrong Ridge	12B3	6800	3/1	82	27.2	18.5	19.3	21.1	5
Wrong Creek (Marias River)	12B4	5700	2/28	62	20.4	12.6	14.3	15.1	5
Marias Pass (Milk River)	13A5	5250	3/3	75	24.3	15.2	18.6	15.0	20
Rocky Boy	9A1	5200	3/3	17	4.3	3.9	6.6	4.7	13
<u>UPPER YELLOWSTONE</u>									
Canyon	10E3	7750	3/1	47	15.1	13.9	16.3	13.6	8
Cooke City	10D7	7400	2/28	33	9.8	8.5	9.3	6.8	17
Crevice Mt.	10D5	8400	2/28	32	7.4	7.9	11.7	8.3	15
Lake Camp	10E4	7850	3/1	38	9.5	8.8	12.8	9.1	17

\*Adjacent Basin







## MONTANA SNOW SURVEYS - MARCH 1, 1954

MISSOURI BASIN DRAINAGE BASIN AND SNOW COURSE	No.	Elev.	SNOW COVER MEASUREMENTS							Years of Record	
			1954		Past Record			Water 1953	Content (In.) 1952		
			Date of Survey	Snow Depth (In.)	Water Content (In.)	Water 1953	Content (In.) 1952		Average		
<u>SHOSHONE RIVER</u>											
East Entrance	10E6	7000	3/1	36	10.8	10.9	13.0		10.7	5	
Sylvan Pass	10E5	7100	3/1	46	11.5	13.1	14.5		13.3	11	
<u>TONGUE RIVER</u>											
Burgess Jct.	7E4	7900	3/3	50	16.2	11.8	10.3		11.1	3	
Big Goose	7E2	7700	3/4	15	3.8	4.2	4.6		3.7	3	
Dome Lake	7E5	9000	3/4	32	8.8	6.6	5.6		5.5	4	
<u>POWDER RIVER</u>											
Sour Dough	6E1	8500	3/5	24	5.4	6.0	--		6.0	1	
North Powder	7E8	8500									
Soldier Park	7E6	8700	3/5	15	1.9	3.3	3.6		3.7	3	
Muddy Pass	7E7	9700									
<u>KOOTENAI RIVER ABOVE</u> Libby, Mont.											
Brush Creek, Mont.	14A4	5000	2/26	58	18.8	10.8	11.9		12.7	7	
Fernie, B.C.	10	3500	3/1	50	15.2	8.0	9.5		7.7	15	
Fernie, New, B. C.	10A	4100	3/1	70	21.3	13.8	13.9		14.0	3	
Kimberley, B. C.	20B	3800	2/28	46	12.2	7.7	9.0		6.6	13	
Marble Canyon, B. C.	32	5000	3/1	62	16.5	14.7	13.6		14.7	7	
Red Mountain, Mont.	15A1	6000	3/1	75	24.4	17.6	16.7		15.8	17	
Sinclair Pass, B. C.	8A	4500	3/2	34	8.9	4.5	5.6		5.3	8	
Sullivan Mine, B. C.	20A	5100	3/1	54	17.4	13.2	16.1		13.2	8	
Upper Elk River, B.C.	41	4400	3/1	47	12.9	6.8	6.5		8.2	6	
<u>BITTERROOT</u>											
Gibbons Pass	13D2	7100	2/25	64	21.4	24.4	25.6		19.3	20	
Nezperce Pass	14D1	6575	2/24	48	14.0	--	--		15.1	15	
Nezperce Camp	14D2	5580	2/25	42	11.5	--	--		11.2	14	
*Moose Creek	13D16	6200	3/1	51	15.6	19.0	--		14.2	14	

\*Adjacent Basin



## MONTANA SNOW SURVEYS - MARCH 1, 1954

COLUMBIA BASIN DRAINAGE BASIN AND SNOW COURSE	No.	Elev.	SNOW COVER MEASUREMENTS						
			1954			Past Record			Years of Record
			Date of Survey	Snow Depth (In.)	Water Content (In.)	Water 1953	Content 1952	(In.) Average	
<u>FLATHEAD RIVER</u>									
Blue Bird	14A1	6800							
Basin Creek	13B14	5000	3/2	45	13.1	5.9	10.7	8.7	3
Big Creek	13B3	6750	3/5	94	35.5	35.8	40.4	35.4	13
Brush Creek	14A4	5000	2/26	58	18.8	10.8	11.9	12.7	7
Cattle Queen	13A1	4700	2/28	116	38.4	29.5	32.4	30.1	9
Desert Mountain	13A2	5600	2/25	51	16.6	12.3	16.1	12.8	10
Goat Mountain	12B7	7000	3/3	57	16.3	9.5	11.2	8.7	20
Hell Roaring Div.	14A3	5700	2/24	88	31.4	26.2	28.6	29.4	4
Holbrook	14B13	4530	3/2	45	12.3	7.1	11.1	9.1	3
Kishenehn	14A2	4300	2/26	41	11.5	7.6	7.6	8.1	8
Logan Creek	14A5	4300	2/23	38	10.6	6.4	8.1	8.4	7
Marias Pass	13A5	5250	3/3	75	24.3	15.2	18.6	15.0	20
N. Fork Jocko	13B7	6330	3/3	111	42.2	37.0	37.4	36.0	13
Quintonkon	13A13	3800	3/2	49	15.6	10.8	17.8	13.8	3
Coyote Hill	13B11	4200	3/1	42	13.2	11.4	13.7	10.0	7
Spotted Bear Mt.	13B2	7000	3/1	48	15.9	11.1	15.6	16.1	6
Strawberry Lake	13B10	6500	3/2	96	33.2	--	--	38.6	3
Trinkus Lake	13B1	6500	3/2	114	42.6	--	--	36.2	4
Trout Lake	13A12	3600	2/28	57	18.5	13.2	17.3	17.9	5
Twin Creeks	13B11	3580	2/28	42	14.8	9.0	12.7	10.8	3
Upper Holland	13B5	7000	3/2	103	36.9	--	--	31.8	4
<u>PEND ORIELLE</u>									
Hoodoo Creek	13C1	6200	3/1	166	63.3	--	--	43.1	3
<u>UPPER CLARK FORK</u>									
Coyote Hill	13B11	4200	3/1	42	13.2	11.4	13.7	10.0	7
Chessman Res.	12C5	6200	3/1	15.	3.4	4.2	5.7	4.4	18
Intergaard	13C4	6450	3/1	27	6.7	7.6	8.4	6.1	18
North Fork Jocko	13B7	6330	3/3	111	42.2	37.0	37.4	36.0	13
Picnic Grounds	13C6	6500	3/1	20	4.2	6.0	6.2	4.4	9
Pipestone Pass	12D1	7200	3/1	17	4.4	4.9	4.9	4.2	16
Southern Cross	13C5	6500	3/1	22	6.0	5.6	9.1	4.6	18
Stemple Pass	13C1	6900	3/2	45	12.1	8.9	12.0	8.3	20
Storm Lake #2	12C7	7780	3/1	41	10.5	12.8	--	--	1
Stuart Mill	13C6	6500	3/1	20	5.5	6.4	7.4	5.1	18
Tenmile, Lower	12C2	6250	3/3	26	6.4	6.4	7.2	5.7	19
Tenmile, Middle	12C3	6800	3/4	35	8.8	9.5	10.1	8.3	20
Tenmile, Upper	12C4	8000	3/4	39	10.9	12.1	12.9	10.7	19
*49 Meadows	15B10	5000	3/1	117	44.2	--	--	30.0	14
*Lookout	15B2	5250	3/1	125	45.8	29.8	37.0	29.8	29
Fish Lake			3/1	121	39.8	35.7	37.3	36.5	2



## SNOW SURVEY DATA COLLECTED BY SOIL CONSERVATION SERVICE

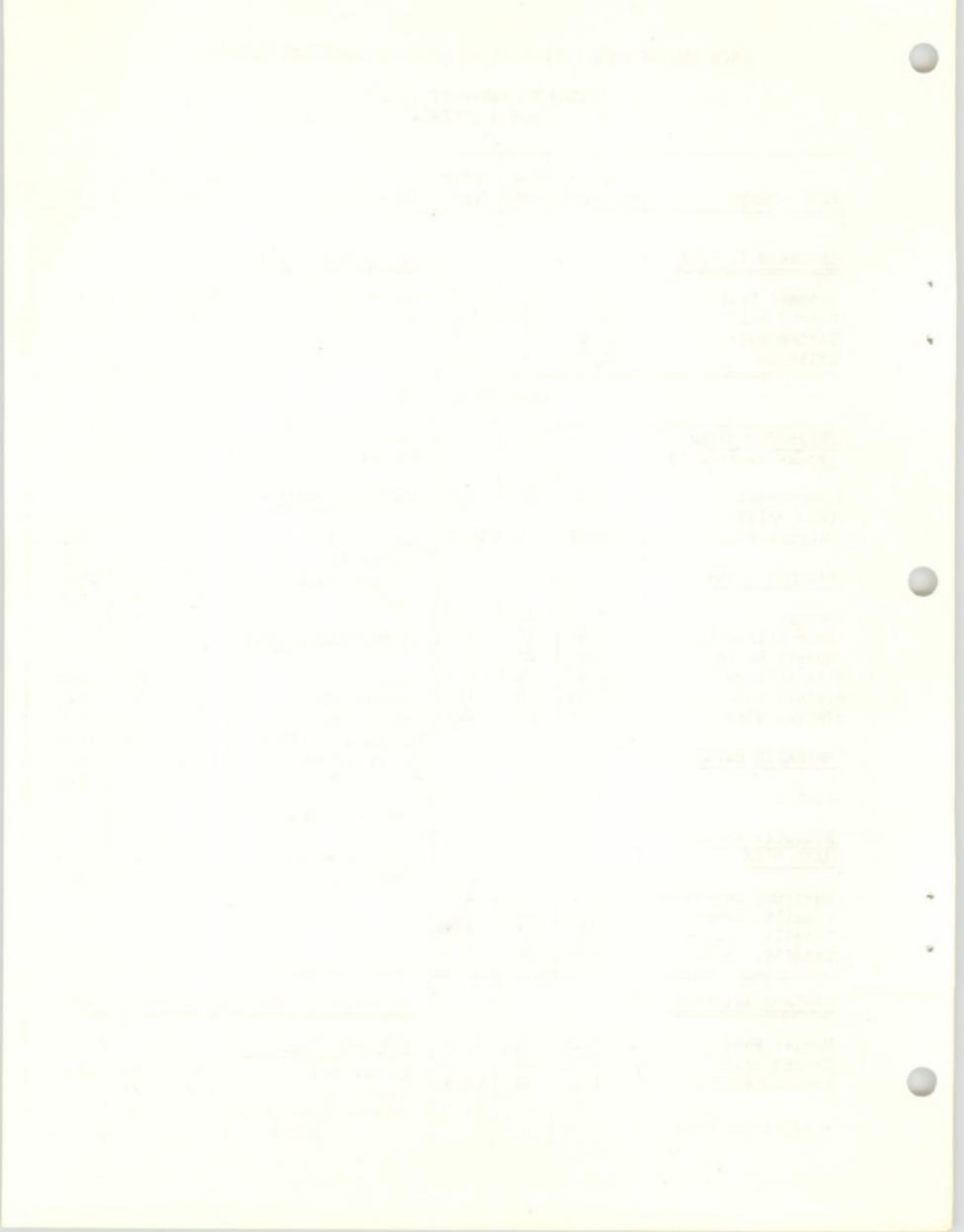
PRIOR TO FEBRUARY 1, 1954

Season 1953-54

SNOW COURSE	Date Measured	Snow Depth	Water Cont.	SNOW COURSE	Date Meas.	Snow Depth	Water Cont.
<u>DECEMBER 1, 1953</u>				<u>DECEMBER 15, 1953</u>			
Gibbons Pass	12/1	21	4.4	Marias Pass	12/21	28	6.2
Coyote Hill	12/2	8	1.2	Coyote Hill	12/16	13	3.3
Marias Pass	12/4	13	2.0				
Holbrook	12/8	9	2.0				

JANUARY 1, 1954

<u>JEFFERSON RIVER</u> (Rock-Beaverhead)				(Marias River) Marias Pass	1/5	49	10.8
*Camp Creek (Big Hole)	1/1	15	2.7	<u>COLUMBIA BASIN</u>			
Gibbons Pass	12/31	41	10.8	Coyote Hill	1/4	18	5.2
				Desert Mt.	1/2	27	5.7
<u>MADISON RIVER</u>				Lookout Pass	1/4	84	18.8
Hebgen	1/5	22	5.3	Holbrook	1/2	19	2.5
West Yellowstone	1/4	19	3.7	<u>UPPER YELLOWSTONE</u>			
Norris Basin	1/5	21	3.3	Canyon	1/1	20	4.8
*Big Springs	12/28	32	6.1	Cooke City	1/3	18	3.3
*Island Park	12/29	26	4.5	Lake Camp	1/1	16	3.2
*Valley View	12/29	17	2.4	*Lewis Creek Div.	1/1	53	14.9
<u>GALLATIN RIVER</u>				*Astor Creek	1/1	45	9.3
21-Mile	1/4	33	6.5	*Tom Thumb Summit	1/1	31	6.3
<u>MISSOURI RIVER</u> <u>MAIN STEM</u>				(Shoshone River)			
Chessman Reservoir	1/4	6	1.7	East Entrance	1/1	16	3.3
Tenmile, Lower	1/4	14	3.0	Sylvan Pass	1/3	22	4.0
Tenmile, Middle	1/3	21	4.3				
Tenmile, Upper	1/3	20	5.2				
<u>JANUARY 15, 1954</u>				<u>FEBRUARY 1, 1954 (See February Bulletin)</u>			
Marias Pass	1/16	62	12.9	<u>FEBRUARY 15, 1954</u>			
Coyote Hill	1/16	32	6.3	Marias Pass	2/16	74	22.5
Lookout Pass	1/15	93	24.4	Coyote Hill	2/17	37	11.1
* Adjacent Basin				Gibbons(Lost Trail Pass)	2/17	100	35.0





Federal - State - Private  
COOPERATIVE SNOW SURVEYS

Furnishes the basic data necessary for forecasting water supply for irrigation, domestic and municipal water supply, hydro-electric power generation, navigation, mining and industry

## "WATER IS THE WEST'S GREATEST RESOURCE"